Precalculus

Algebra

Students in Precalculus use matrices to solve problems. They analyze the behavior of sequences and series.

Examples: $\begin{bmatrix} 2 & 3 \\ -2 & 1 \end{bmatrix} \bullet \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ $\qquad$ $\sum_{k=1}^{100} k$

Functions

Students graph, analyze, and solve problems using many different functions.

Examples: Graph $y = \dfrac{x^2}{x+1}$ $\qquad$ Solve $x^3 - 3x^2 - 4x + 12 = 0$

Geometry

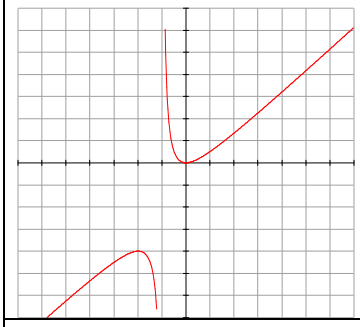
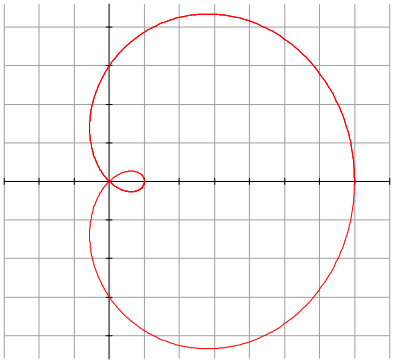
Students solve problems using trigonometry and graph curves using polar and parametric equations. Students solve problems involving conic sections.

Examples: Find the measures of the angles of a triangle whose sides measure 5ft, 8ft, and 7ft.
Graph $r = 4\cos\theta + 3$

Probability and Statistics

Students compute probabilities using distributions and the Normal Curve. They fit functions to data using regression methods and technology.

Examples: Find ${}_4C_2$

Algebra	
$\begin{bmatrix} 2 & 3 \\ -2 & 1 \end{bmatrix} \bullet \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ $\begin{bmatrix} 2(1)+3(0) & 2(0)+3(1) \\ -2(1)+1(0) & -2(0)+1(1) \end{bmatrix} =$ $\begin{bmatrix} 2 & 3 \\ -2 & 1 \end{bmatrix}$	$\sum_{k=1}^{100} k$ $\sum_{k=1}^{100} k$ means add all the integers from 1 to 100 $\frac{100(1+100)}{2} = 5050$
Functions	
Graph $y = \frac{x^2}{x+1}$ 	Solve $x^3 - 3x^2 - 4x + 12 = 0$ **This can be solved by** • Factoring • Graphing • Synthetic division The answer is $\{-2, 2, 3\}$
Geometry	
Find the measures of the angles of a triangle whose sides measure 5ft, 8ft, and 7ft. The Law of Cosines: $a^2 = b^2 + c^2 - 2bc\cos A$ $5^2 = 8^2 + 7^2 - 2(8)(7)\cos A$ $A \approx 38^o$ The Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b}$ $\frac{\sin 38^o}{5} = \frac{\sin B}{8}$ $B \approx 80^o$ $C \approx 62^0$	Graph $r = 4\cos\theta + 3$ 
Probability and Statistics	
Find ${}_4C_2 = \frac{4!}{2!2!} = 6$	